

PCE/CA 2004/001498



Consumer and
Corporate Affairs Canada

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et Corporations Canada

(11) (A) No. 1 241 193

(45) ISSUED 880830

(52) CLASS 37-15

(51) INT. CL. E01H 5/06⁴

(19) (CA) **CANADIAN PATENT** (12)

(54) Ice-Resurfacing Scraping Blade

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(21) APPLICATION NO. 494,983

(22) FILED 851108

NO. OF CLAIMS 5

Canada

DISTRIBUTED BY THE PATENT OFFICE, OTTAWA.
CCA-274 (11-82)

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ABSTRACT OF THE DISCLOSURE

This invention relates to ice-scrapers for resurfacing the ice sheets of hockey rinks. There is disclosed a rectangular ice-scraping hardened blade defining two opposite faces and four sides, and a blade holder releasably secured to one of the blade faces by a nut and bolt assembly and adapted to be mounted to an ice-resurfacing machine. Each of the blade longitudinal sides is concave and defines two sharpened edges. The hole and nut assembly allows 180-degree incremental rotation and also inversion of the blade relative to the holder, so that any of the four sharpened edges can be used as the frontwardly-loading scraping edge for the resurfacing of an ice-rink upon forward motion of the holder with concurrent forward sliding of the blade bottom face flatly against the ice to be resurfaced.

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FIELD OF THE INVENTION

This invention relates to ice-scrapers for resurfacing the ice sheets of hockey rinks.

BACKGROUND OF THE INVENTION

Ice-scraping machines for resurfacing ice sheets already exist. These machines conventionally comprise an automotive tractor to the underside of which is secured a scraping blade. The blade has one sharpened longitudinal cutting edge. The blade scrapes the ice surface irregularities, such as formed by the skate blades of hockey players.

The present inventor is aware of only two manufacturers of such machines. The first one is Zamboni & Co., of California, U.S.A., with their »ZAMBONI« machine having a blade whose dimensions are 77 inches long, 5 inches wide and 1/2 inch thick, with a single sharpened scraping edge. The second is Resurface Inc., of Ontario, Canada, with their »OLYMPIA« machine having either one of these blades: a first blade whose dimensions are 80 inches x 4 inches x 1/2 inch, and a second blade whose dimensions are 84 inches x 4 inches x 1/2 inch, both blades having a single sharpened cutting edge.

It is apparent that the scraping edge is subjected to rapid wear. A sharpened scraping edge is required for efficient resurfacing of the ice rink. Resharpening of such large blades is costly, since it requires experienced servicemen and also an appropriate grinding machine. In Canada, for example, the present inventor knows only of three cities where such grinding machines are available: Montreal, Toronto and Vancouver. Therefore, ice rink operators located away from these cities entail substantial shipping costs and delays and must also keep a higher inventory of such scraping blades.

OBJECT OF THE PRESENT INVENTION

The general object of the present invention is to

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increase substantially the durability of the scraping blade of an ice resurfacing machine before resharpener is required.

SUMMARY OF THE INVENTION

There is accordingly disclosed a rectangular ice-scraping blade defining two opposite faces, two longitudinal sides and two small sides, adapted to be mounted by a holder to the underside of an ice-resurfacing machine. Each of the blade longitudinal sides is concave and defines two sharpened edges. The blade may be rotated at 180 degrees and also be inverted relative to the holder, so as that any one of the four sharpened edges can be used as the frontwardly-loading scraping edge for the resurfacing of an ice rink upon forward action of the resurfacing machine.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a cross-sectional view of a scraping blade according to the invention, with its associated resurfacing machine holder and of the ice layer to be resurfaced;

Figure 2 is a fragmented top plan view of said scraping blade; and

Figure 3 is an end elevation of said scraping blade.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

Referring to Figures 2-3, an ice-scraping blade 10 is detailed. Blade 10 is rectangular, defining main top and bottom faces 12, 14, two longitudinal concave sides 16 and two small sides 17. Longitudinal side edges 18 constitute the meeting of one side 16 with a main blade face 12 or 14, wherein both edges 18 of each side 16 are sharpened, so that four distinct sharpened edges 18 are defined.

In between a line parallel to a main face 12 or 14 and a virtual line tangent to the side 16 adjacent the

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corresponding edge 18, an angle of, preferably, 15 to 20 degrees is formed. This is slightly less than the 22 1/2 degree found in conventional ice-resurfacing blades. Each concave side 16 also preferably defines a 3/8th-of-an-inch radius of curvature.

10 The blade 10 has a number of pairs of through-bores 20, each pair extending symmetrically relative to the others and parallel to a given small side 17 thereof.. A through-bore 20 defines an intermediate annular portion 22A of reduced diameter and top and bottom portions 22B, 22C, outwardly flaring from the intermediate portion 22A. Annular portion 22A is of such a diameter as to be rotatively engageable by a bolt 24, wherein the bevelled head thereof at 26 may occupy one of portions 22B or 22C, so as to extend short of corresponding faces 12 or 14.

20 The blade 10 is specifically adapted for connection to a blade holder 28 of an ice-resurfacing machine, not shown, for resurfacing an ice layer I. Holder 28 is of L-shape cross-section, see Figure 1, and its bottom leg 28A has a number of bores 30 registering with those of blade 10 for engagement by bolts 24. The blade 10 is fixedly secured to the holder 28 by nuts 32 and washers 34 disposed on the top side of holder leg 28A.

As illustrated in Figure 1, the holder 28 will be displaced forwardly along the ice rink, following arrow 36. The bottom face 14 of the blade 10 will slide flatly or at a small angle against the ice surface 1, wherein it will be leading edge 18' which will be the scraping edge of the blade.

30 Once leading operative edge 18' is dull, the blade can be rotated through 180° relative to the holder and fixed to the latter by using the other bores 20 of the pairs of such bores for receiving bolts 24. The trailing lower

edge 18 is now the leading operating edge. The same procedure is repeated for the other edges 18 after blade inversion. Therefore, the blade 10 for an ice rink resurfacing job will last four times longer than a conventional such blade.

The blade may be 80 to 84 inches long, about 4 inches wide and most preferably of $\frac{3}{4}$ th of an inch in thickness (compared with the usual $\frac{1}{2}$ inch). Blade 10 should be made of hardened steel.

As is conventional, blade holder 28' can be adjustably inclined, preferably by remote control, to vary the inclination of blade 10 relative to the ice surface I in either direction from the position of Fig. 1; therefore, the trailing cutting edge can be used to smooth out the ice surface.

Throughout the description and claims, the term »ICE-SCRAPING BLADE« is deemed a synonym of »ICE-SHAVING BLADE«, the latter commonly used in the trade.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED, ARE DEFINED AS FOLLOWS:

1. A rectangular ice-scraping blade of uniform thickness and defining two opposite main faces, two longitudinal sides and two small sides and adapted to be fixed by a holder to the underside of an ice-resurfacing machine; each of said blade longitudinal sides is concave and defines a pair of sharpened scraping edges at its junction with the respective main faces.

2. The ice-scraping blade as defined in claim 1, wherein the included angle defined by a main face and tangent to the portion of a concave side adjacent to each said scraping edge, is between 15 and 20 degrees.

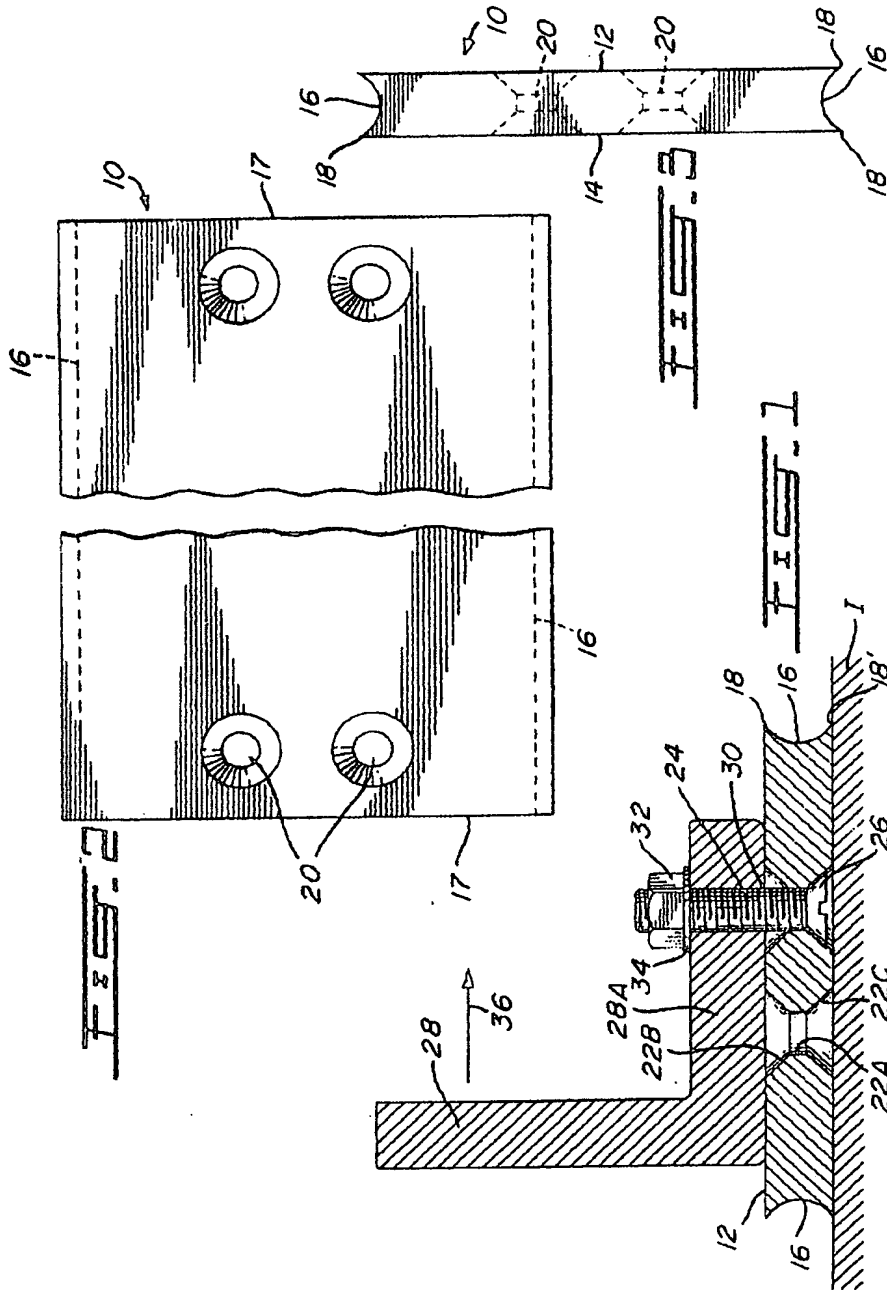
3. The ice-scraping blade as defined in claim 2, wherein said blade has a thickness of $\frac{3}{4}$ th of an inch, and wherein the concavity of each said blade longitudinal sides has a radius of curvature of $\frac{3}{8}$ th of an inch.

4. The ice-scraping blade as defined in either of claim 1, 2 or 3, wherein said blade has longitudinally-spaced pairs of through-bores arranged along straight lines parallel to said small sides and the through-bores of each pair being equally spaced from the nearer longitudinal side.

5. The ice-scraping blade as defined in claim 1, 2 or 3, wherein said blade has through-bores for receiving bolts with tapered heads for attachment to said holder, said blade through-bores having an intermediate portion of reduced diameter and two outwardly-tapering end portions, whereby each said bolt head may occupy either one of said through-bore end portions.



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